AF/2811

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Docket No.: GR 97 P 2734

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By: _____ Date: May 21, 2003

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
Before the Board of Patent Appeals and Interferences

Applicant : Frank Hintermaier

Applic. No. : 09/161,196

Filed : September 25, 1998

Title : Capacitor Having a Barrier Layer Made of a Transition Metal Phosphide, Arsenide or Sulfide

Examiner : Cuong Q. Nguyen - Art Unit: 2811

REPLY BRIEF

Hon. Commissioner of Patents and Trademarks,
Washington, D. C. 20231,

S i r :

This *Reply Brief* is in reply to the *Examiner's Answer* dated March 21, 2003.

Arguments:

In the last paragraph on page 5 of the *Examiner's Answer*, the Examiner stated that:

> Applicants argue that US 705,685 is in a field of "telephony" which is different than the field of the present invention, so it can not be used as a reference against the present invention. In response, US 705,685 is used to support the fact that gallium is a transitional element. This chemical fact is true for all fields and not just true only in telephony filed.

The above characterization of Appellant's argument is a distortion of the actual arguments brought forth by Appellants.

Appellants stated in the second paragraph on page 8 of the *Brief on Appeal* that:

> US 705,685 (*Lyons*) was issued on July 29, 1902, and it pertains to telephony. US 705,685 mentions neither "transition metals" nor "Gallium", and is in a field of "telephony" which is a completely different field of technology than the field of technology of the instant application. It is assumed that either the patent number cited by the Examiner is incorrect or that the Examiner may have confused the name of the inventor Joseph Lyons of US 705,685 with the name of the (co)inventor, James E. Lyons, of US 5,990,348, US 6,043,184, and US 6,060,419.

Appellants still assert that US 705,685 contains neither the word "gallium", the term "transition metal", nor any passage that could be considered as representing any kind of definition of the term "transition metals". It should be

noted that the Examiner has failed to point out any passage in US 705,685 (*Lyons*), which would support the Examiner's argument that the element gallium is a transition metal. Appellants note in the *Prior Art of Record* in the *Examiner's Answer* a new reference US 5,***705,685*** (emphasis added) in which James E. Lyons is a co-inventor.

In the first paragraph on page 6 of the *Examiner's Answer*, the Examiner stated that:

> Applicants argue that in the expression "X is a group ***IIB***, IVB, VB, VIB or transition element, such as phosphorus, silicon, gallium, aluminum, arsenic, germanium, boron, cobalt, cerium, praseodymium, uranium and thorium", the list "phosphorus, silicon, gallium, aluminum, arsenic, germanium, boron, cobalt, cerium, praseodymium, uranium and thorium" refers to groups IIB, IVB, VB, VIB and transition element, but not transition metals alone, so gallium is not a transition element.

(emphasis added)

The Examiner then stated: "[i]n response, in PERIODIC TABLE OF ELEMENTS, groups ***IIB***, IVB, VB, VIB do not contain gallium, so gallium has to be a transition element." (emphasis added)

The above argument is based on an incorrect quotation and application of Appellants' argument. The third paragraph on page 8 of Appellant's *Brief on Appeal*, states:

> In column 8, lines 2-5, (similarly, column 10, lines 23-27, and column 14, lines 45-48) *Lyons et al.* state that "X is a Group IIIB, IVB, VB, VIB **or** transition element, such as phosphorus, silicon, gallium, aluminum, arsenic, germanium, boron, cobalt, cerium, praseodymium, uranium and thorium" (emphasis added). It is believed that the Examiner's insistence that Gallium is a transition metal is based on this passage.

(underlining added for emphasis)

Gallium is unquestionably categorized as a IIIB element in the PERIODIC TABLE OF ELEMENTS. This is clearly stated in every one of the numerous citations from the standard chemical text books ("Main Group Chemistry", "Concise Encyclopedia of Science & Technology") and portions of encyclopedias filed by the Appellants.

In the second paragraph on page 6 of the *Examiner's Answer*, the Examiner stated that:

> Applicants argue that the word "**can**" in the expression "Certain Group VB nonmetal elements, such as: N, P, As, and Sb **can** react with titanium to form barrier material (e.g., TiN, TiP, TiAs, and TiSb)" in US6015997's col.7 lines 55-57 is not absolute or certain. Therefore, it is not inherent that the transition metal layer will react with phosphorous from the connection structure.

(emphasis original).

The Examiner then stated:

> In response, the definition of word "can" according to Webster's dictionary is "to be able to do, make, or accomplish"; none of these meanings means "not

absolute" or "not certain" as alleged by Applicant. Therefore, according to the teaching of US6015997, the transition metal layer (12) in Kawakubo et al. ***will react*** with phosphorous from the connection structure to form a barrier material layer of TIP or TaP as claimed.

(emphasis added).

As discussed in MPEP § 2112, an element of a claim that is not expressly or implicitly disclosed in a prior art reference is inherently disclosed therein if, and only if, the "missing" element is ***necessarily*** present in the prior art. "Can" is not "necessarily" or "will".

The honorable Board is therefore respectfully urged to reverse the final rejection of the Primary Examiner.

Respectfully submitted,

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For Appellant

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